

**The Sir Richard Stone Lectures:  
Growth and Distribution, 1**

by

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**Key Propositions**

1. The poor: They are out there, and they are truly wretched.
2. Growth is good—for everyone, and especially for the poor.
3. To aid the poor, whether growth raises or lowers inequality is second-order. Similarly, whether inequality within society helps or hinders economic growth.
4. There isn't a question of growth and a question of distribution: Growth and distribution are functionally the same. There is only ONE problem.

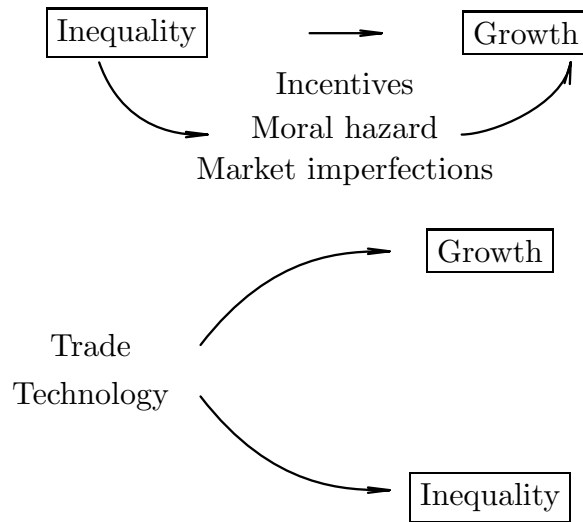


Fig.: Growth and Distribution/Inequality — Mechanism

## OUTLINE

1. **WHEN AND WHERE** Dynamics. Space
2. **WHY** Why inequality matters
3. **WHAT** Why, ultimately, inequality matters not
  - (a) Aggregate growth
  - (b) Inequalities
  - (c) ... together
  - (d) The very poor
4. **HOW** Causality: Globalization, Technology, Aid

# 1 7 million here, 6 billion there — it soon adds up

1.  $7 \times 10^6$  BCE — Out of Africa
2. 1998 —  $6 \times 10^9$
3. In between

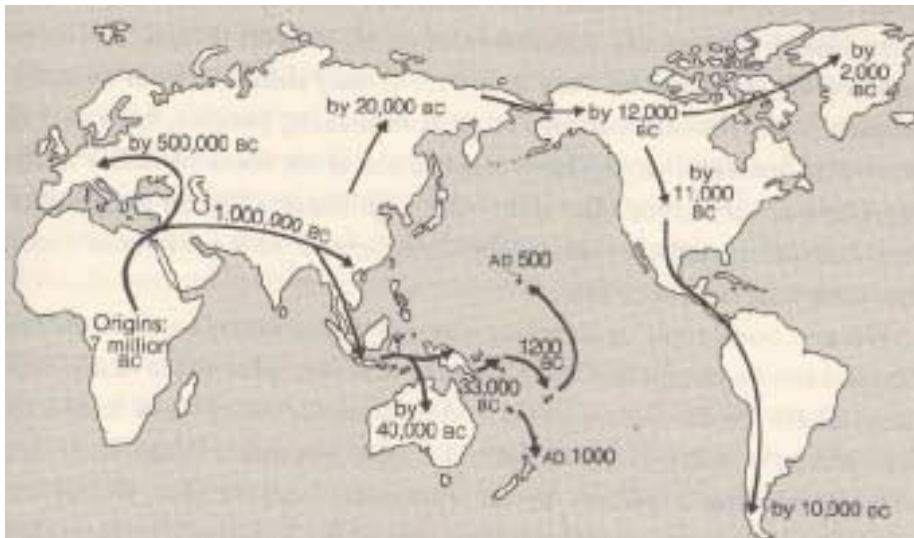
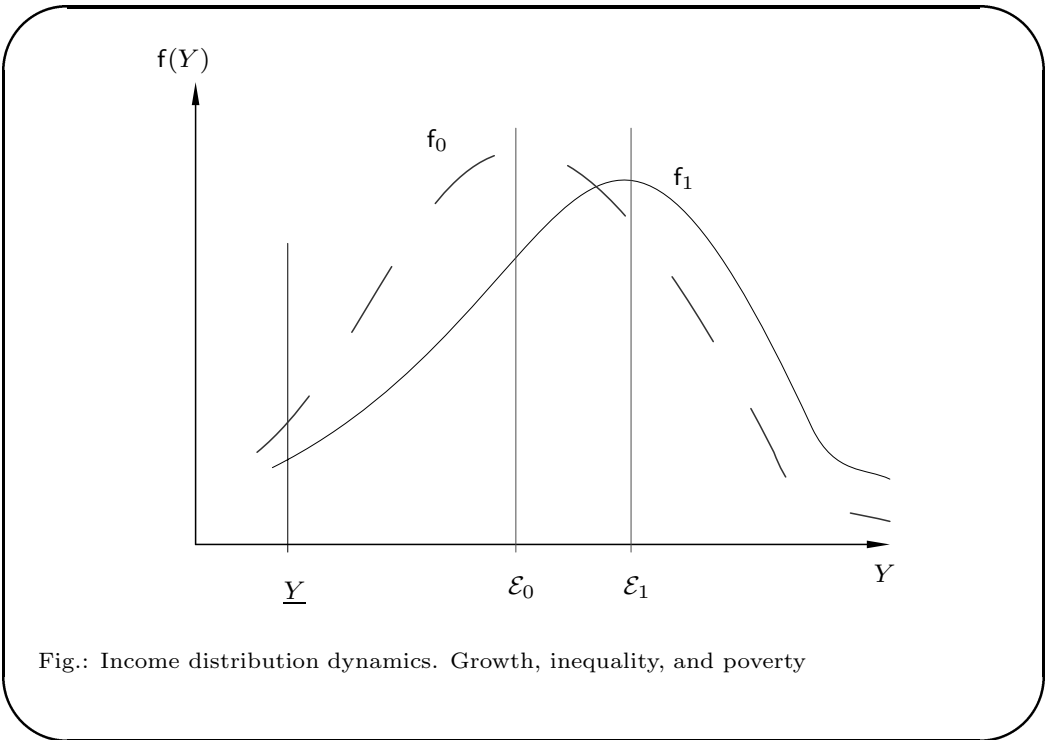
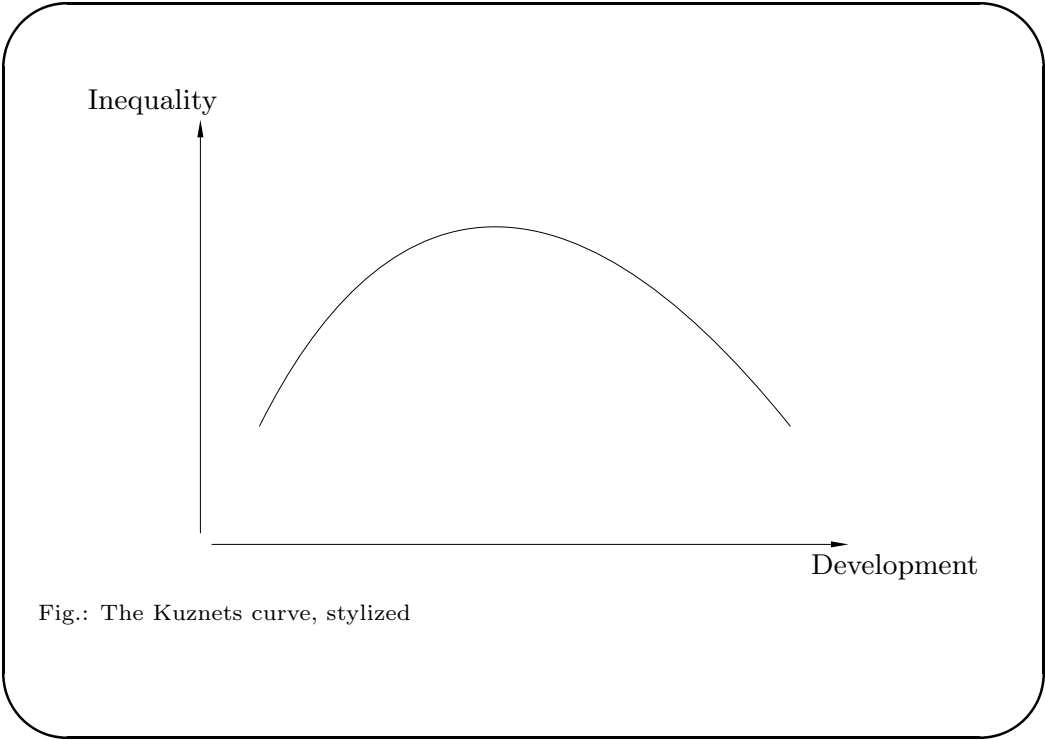


Fig.: Geographical and dynamic spread of humanity (from Diamond, 1997)



**$7 \times 10^6$  years after:**

	< \$1/day, $10^6$ /%	Popl., $10^6$ /%	Conc.
South Asia	522/43.5	1305/26.0	1.7
Sub-Sah. Africa	291/24.3	629/12.6	1.9
East Asia	278/23.2	1817/36.3	0.6
excl. China	65/5.4	575/11.5	0.5
Latin America	78/6.5	500/10.0	0.7
Europe, Cent. Asia	24/2.0	471/9.4	0.2
MENA	6/0.5	289/5.8	0.1
Total:	1199/	5011/	

Table 1: Geographical distribution, 1998

**... and counting:**

	%Popln., < \$1/day					Change	
	1987	1990	1993	1996	1998	$10^6$	%pa
South Asia	45	44	42	42	40	48	1.0
Sub-Sah. Africa	47	48	50	48	46	74	2.9
East Asia	27	28	25	15	15	-139	-4.1
excl. China	24	18	16	10	11	-49	-5.6
Latin America	15	17	15	16	16	14	2.0
Europe, Cent. Asia	0.2	2	4	5	5	23	30.8
MENA	4	2	2	2	2	-4	-5.2

Table 2: Geographical distribution dynamics, 1987–1998

## An incoming tide

	$\Delta\$1\text{-poor } 1987\text{--}1998$		Growth	1998 Popln.
	$\times 10^6$	%pa	%pa	$\times 10^9$
South Asia	48	1.0	5.7	1.30
Sub-Sah. Africa	74	2.9	2.4	0.63
East Asia	-139	-4.1	7.4	1.82
Latin America	14	2.0	3.4	0.50
Europe, Cent. Asia	23	30.8	-2.7	0.47
MENA	-4	-5.2	3.0	0.29

Table 3: Growth and the poor, 1990–1998

## 2 Interview with Andrea — Inequality matters

Representative person on earth:

$$E_0 \sum_{t=0}^{\infty} \beta^t U(c_{jt}), \quad \beta \in (0, 1)$$

$$U(c) = \frac{c^{1-\rho} - 1}{1-\rho}, \quad \rho \geq 1$$

$$c_{jt} = \Gamma_j g^t \times \epsilon_{jt}$$

$$\Gamma_j > 0, \quad g > 0$$

$$\log \epsilon_{jt} = (1 - \lambda_j)(-\theta_j/2) + \lambda_j \log \epsilon_{j,t-1} + \eta_{jt}$$

$$|\lambda_j| \leq 1, \eta_{.t} \sim \text{iid } \mathbf{N}(0, \sigma_j^2)$$

$$\theta_j = (1 - \lambda_j^2)^{-1} \sigma_j^2 > 0$$

$$\implies \epsilon \sim \text{log normal}, E \epsilon = 1, \text{Var } \epsilon = e^{\theta_j - 1}, \text{ persistence } \lambda_j$$

**Experiments:**  $\implies \Gamma$

1. Fix  $(\lambda = 0, \theta)$ ;  $g \uparrow \downarrow$
2. Fix  $(\lambda = 0, g)$ ;  $\text{Var } \epsilon \uparrow \downarrow$
3. Fix  $(g, \theta)$ ;  $\lambda \uparrow \downarrow$

$$\bar{g} = 1.02$$

Compensating percent change in  $\Gamma$

$g$	$\beta = 0.95$	$\beta = 0.98$
1.005	32/25/16/9	107/58/24/12
1.01	21/16/9/5	62/32/13/6
1.03	-17/-12/-6/-3	-38/-19/-8/-4
1.04	-31/-21/-10/-5	-61/-32/-13/-6
1.05	-42/-28/-14/-7	-76/-41/-16/-8
1.06	-52/-34/-16/-8	-85/-48/-19/-9
1.07	-60/-39/-18/-9	-90/-53/-22/-10

Table 4: **Growth matters.**  $\text{Var } \epsilon = 0, \rho = 1/2/5/10$ : For small rises in underlying growth rates, people will sacrifice relatively large cuts in consumption levels

$\rho$	$\text{Var}^{1/2}\epsilon \times$	Compensating percent change in $\Gamma$			
		1	2	4	10
1		-0.008	-0.034	-0.135	-0.834
2		-0.017	-0.068	-0.270	-1.662
5		-0.042	-0.169	-0.673	-4.103
10		-0.084	-0.337	-1.341	-8.038
20		-0.169	-0.674	-2.664	-15.430

Table 5: **Distribution doesn't matter?** For significant reductions in underlying uncertainty, people will sacrifice only insignificant cuts in consumption levels

### Persistence and mobility matter

$$\lambda \nearrow 1 \implies \Gamma/\bar{\Gamma} - 1 \rightarrow \boxed{\epsilon^{-1} - 1}, \text{ i.e., proportionally 1-1}$$

$$\lambda \searrow -1 \implies \Gamma/\bar{\Gamma} - 1 \rightarrow \boxed{\left[ \frac{1 + \beta g^{1-\rho} e^{-\theta} \epsilon^{(\rho-1)2}}{1 + \beta g^{1-\rho}} \right]^{\frac{1}{\rho-1}} \epsilon^{-1} - 1}$$

It is the dynamics that are critical.

### 3 Dynamic empirical regularities — Ultimately, inequality doesn't matter

1. Supertankers adrift and grass growing
2. Inequality can dramatically differ across societies
3. But over time it hardly ever changes by much
4. Aggregate growth rates vary — all over the map

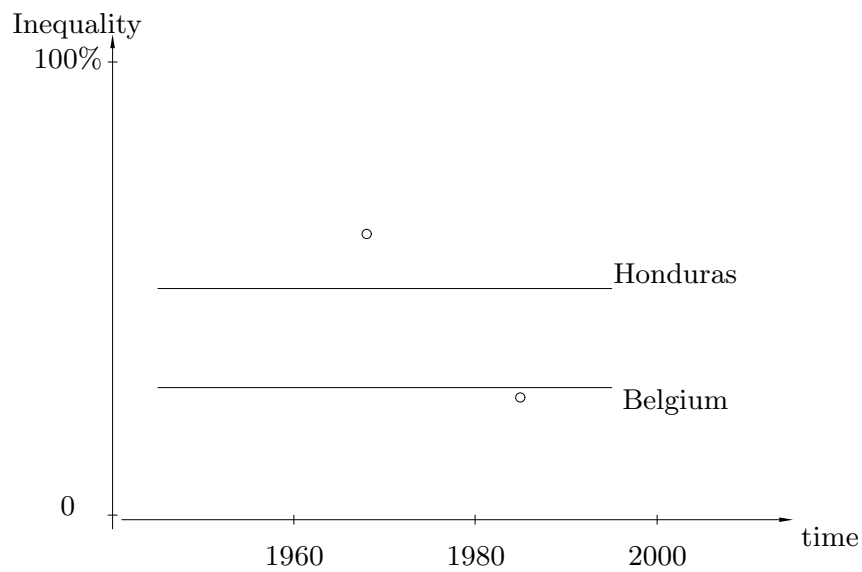


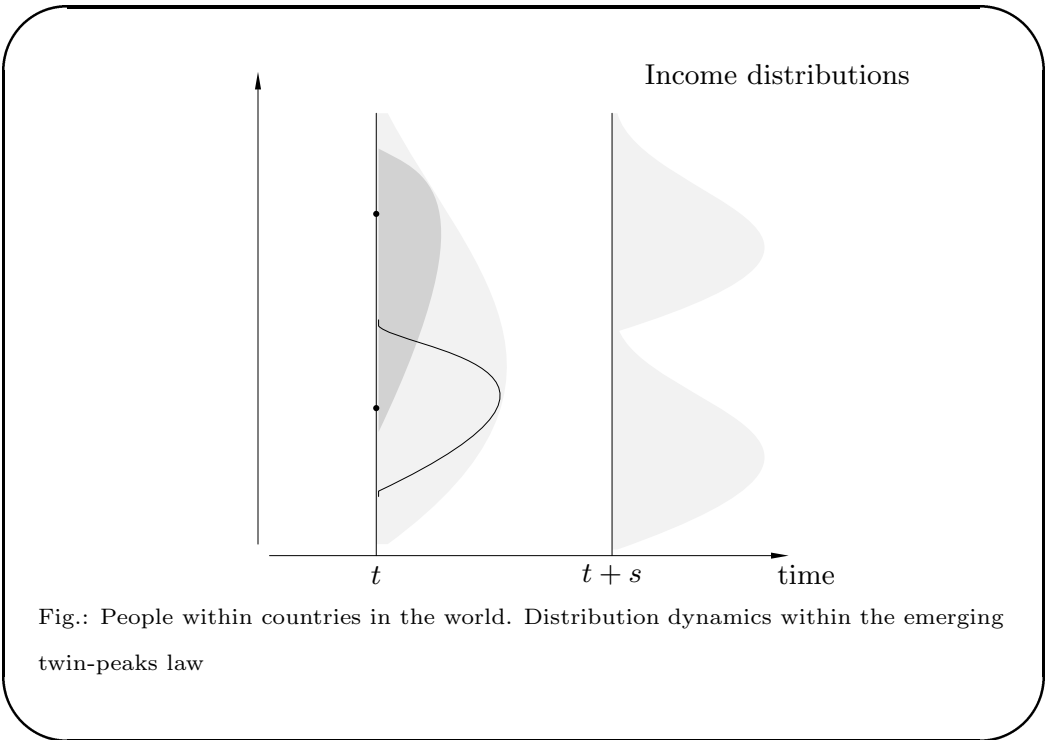
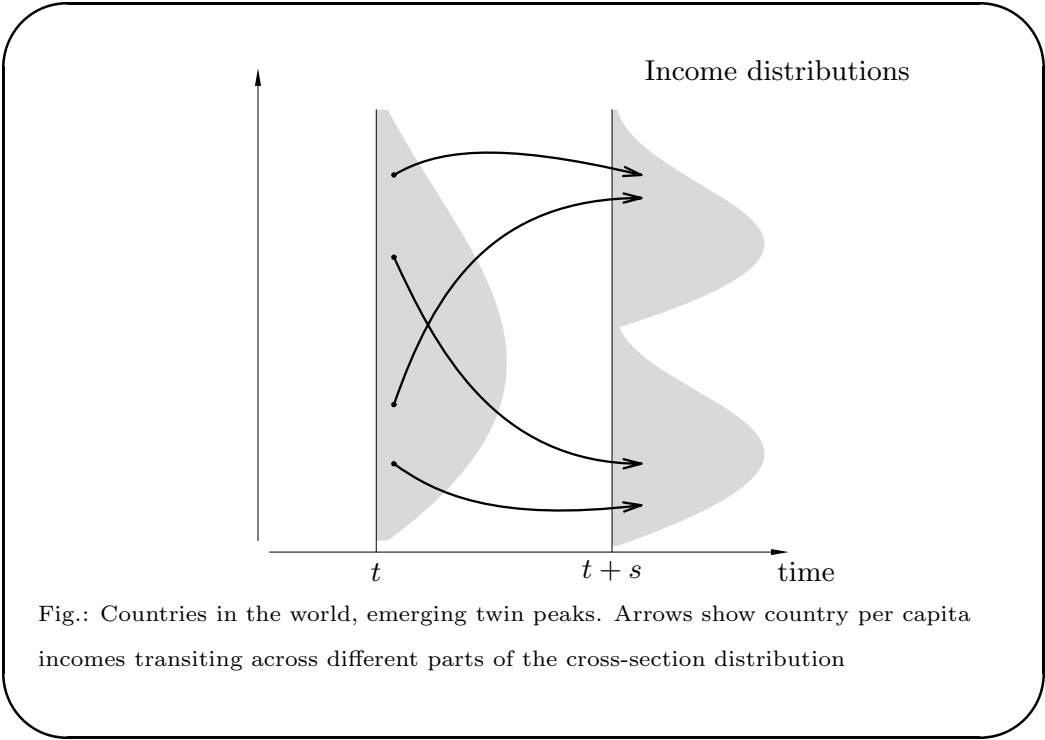
Fig.: Inequality through time and across societies. Maximum and minimum, Honduras and Belgium

	Variance decomposition (%)	
	Across countries	Over time
(575) Gini coeff. $\mathcal{I}_G$	91.2	8.8
(1750) Per capita $\mathcal{E}$	72.8	27.2
(1732) Growth $\dot{\mathcal{E}}/\mathcal{E}$	8.6	91.4
(1702) Smoothed [5 yr.] $\dot{\mathcal{E}}/\mathcal{E}$	22.1	77.9
(1750) Population $P$	95.2	4.8

Table 6: Cross-country dynamics in inequality and growth

Per capita income in national economies	times world per capita income	
	<b>1960–64</b>	<b>1985–89</b>
10th %-ile	0.22 × (26.0% world popn.)	0.15 × (3.3% world popn.)
90th %-ile	2.70 × (12.5% world popn.)	3.08 × (9.3% world popn.)
(25th-15th) %-iles	0.13 ×	0.06 ×
(95th-85th) %-iles	0.98 ×	0.59 ×

Table 7: Cross-country distribution dynamics in per capita incomes



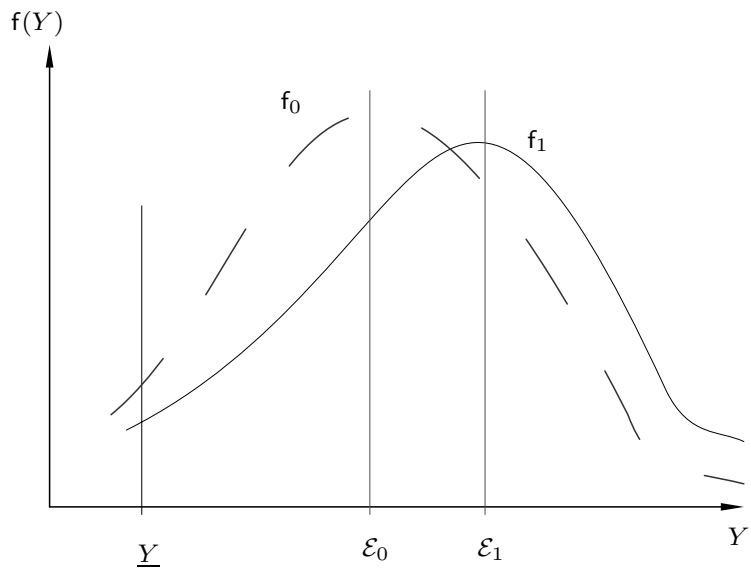


Fig.: Income distribution dynamics. Growth, inequality, and poverty

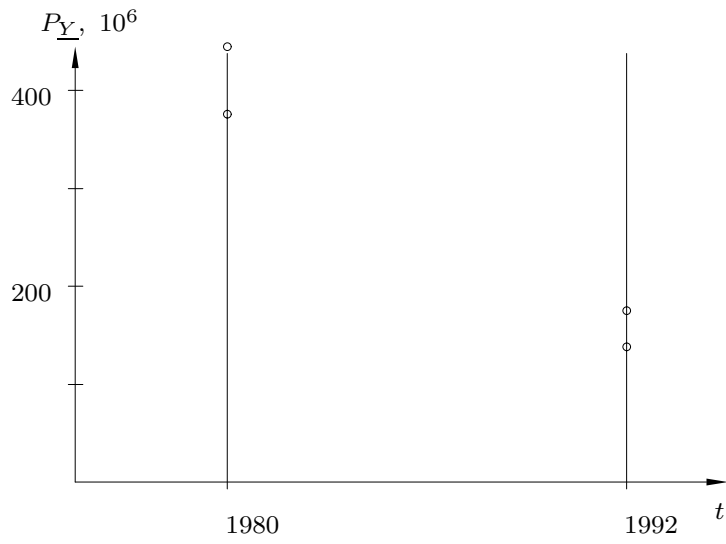


Fig.: China and India. \$2-poverty reduction

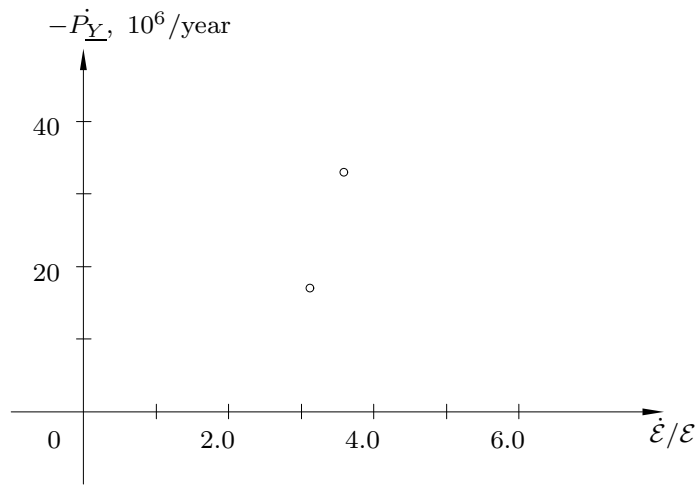


Fig.: China and India. Annual rate of \$2-poverty reduction from growth alone

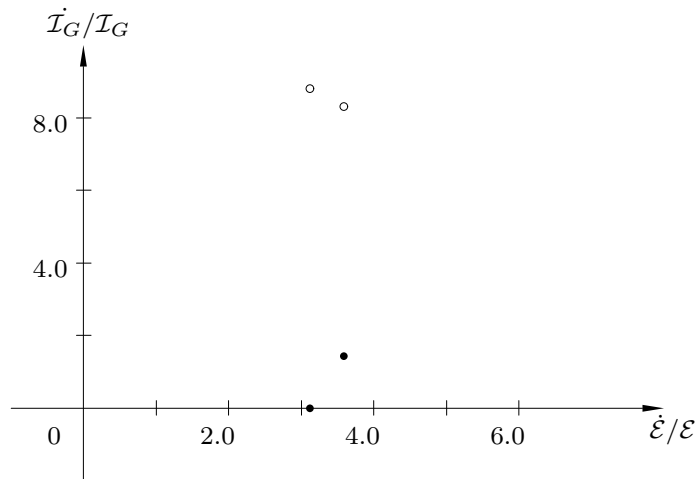


Fig.: China and India. Inequality increases needed to nullify growth, relative to actual increases

Economic Development



Globalization

Fig.: Globalization and Economic Growth

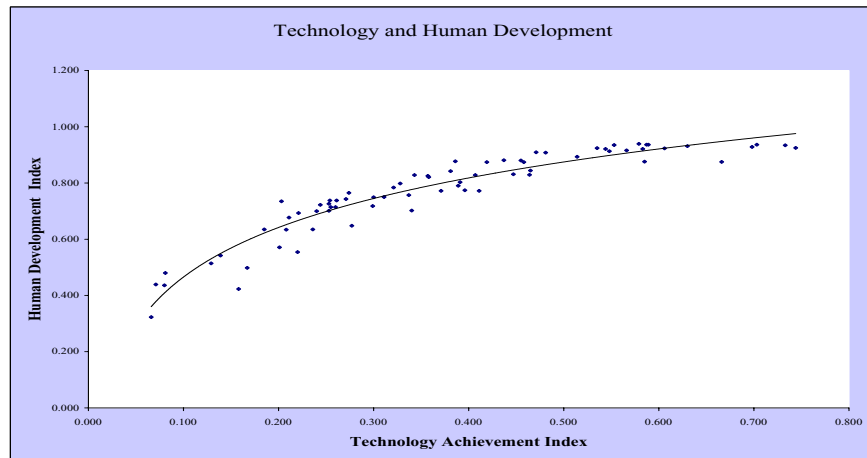


Fig.: Technology and human development, 2001

## 4 Conclusion

1. Who, where, and how: Growth and distribution
2. Why growth and distribution matter, and why they do not
3. Not a problem of growth and a problem distribution: One and the same
4. Growth is good — for everyone, and especially for the poor